

REMARKS

Claims 21-30, 34, and 35 are pending the Application. Claims 21-24, 26-30, 34, and 35 stand rejected by the pending Office Action. Claim 25 stands objected to as being dependent on a rejected claim, but has been identified as being directed to allowable subject matter.

I. Paragraph 3 Rejection of Claims 21-24, 29, 30, 34, and 35

Claims 21-24, 29, 30, 34, and 35 stand rejected under 35 U.S.C. §103(a) as being assertedly unpatentable over Catanzarite, U.S. Patent No. 5,652,704 (“Catanzarite”) in view of Arsem, U.S. Patent No. 3,559,027 (“Arsem”). The Applicant respectfully traverses this rejection.

A. Claims 21 and 29

Claim 21, as amended, recites a shock and vibration isolation system for mounting equipment to a base wall. The system comprises a load plate, a base plate and a spring arrangement disposed intermediate the load plate and the base plate. The system also comprises a magnetorheological (MR) damper engaging the load plate and the base plate and a damper controller. The damper controller is disposed intermediate the load plate and the base plate and is operatively connected to the MR damper for controlling the reaction force applied to the load plate and the base plate. The damper controller includes a rechargeable power supply. The system further comprises a recharging arrangement in electrical communication with the rechargeable power supply. The recharging arrangement comprises at least one piezoelectric generator adapted for converting vibratory motion to electrical energy for storage in the rechargeable power supply.

Claim 29, as amended, recites a self-powered semi-active damping system comprising a semi-active damper and a damper controller, both being disposable intermediate the load plate and the base plate. The damper controller is operatively connected to the semi-active damper for controlling the reaction force applied to the load and the base wall by the damper. The system also comprises a rechargeable power supply disposable intermediate the load plate and the base plate and operably connected to the

damper controller and the semi-active damper. A recharging arrangement in electrical communication with the rechargeable power supply comprises a piezoelectric generator and is mountable to one of the base wall and the load. This recharging arrangement is adapted for converting vibratory motion to electrical energy for storage in the rechargeable power supply.

B. The Catanzarite and Arsem Patents

The Catanzarite and Arsem Patents were discussed in detail in previous Applicant responses. In summary, the Catanzarite patent is directed to a vehicle seat suspension system that uses a controllable fluid damper, which may be an MR damper. The Catanzarite system includes microprocessor controller 42 that sends control signals to a current controller 35 that, in turn, sends signals to the damper 22. Catanzarite Patent, Figure 3. The current controller 22 receives power from a battery 21. The nature and placement of the battery 21 are not discussed. As noted by the Examiner, Catanzarite does not disclose a recharging arrangement.

The Arsem Patent is directed to “an electric shock absorber for automobiles” that converts the mechanical energy supplied to the shock absorber to electricity for charging a battery. The primary embodiment disclosed in the Arsem patent uses a rotor and stator arrangement in which reciprocal motion causes the rotor to rotate, thereby generating current. However, Arsem also states that “other forms of electrical generators may be used, such as piezoelectric generators.” Arsem, col. 1, line 69 to col. 2, line 1. Arsem suggests that the electric shock absorbers of the invention could be used to charge the vehicle battery. Arsem, col. 2, line 70 to col. 3, line 3. He further suggests that the resistance in the circuit could be varied “to control the stiffness of the ride.” There is no suggestion in Arsem of a powered damping system.

C. The Catanzarite and Arsem Patents Do Not Provide a Basis for a Proper Rejection under 35 U.S.C. 103(a)

The Applicant respectfully submits that one of ordinary skill in the art would have no reason to combine the teachings of the Catanzarite and Arsem patents and that, even if one did combine these teachings, they would not teach, disclose or suggest the features of claims 21 and 29.

1. There is no motivation to combine the teachings of Catanzarite and Arsem

It was asserted in the Office Action that “since the two shock absorbers [of Catanzarite and Arsem] are similar in structure . . . adding a piezoelectric generator to the shock of Catanzarite to provide the claimed recharging arrangement would not be beyond the realm of one of ordinary skill in the art.” While they may be similar in purpose, the Applicant strongly disagrees that the Catanzarite and Arsem devices are “similar in structure.” More importantly, whether one of ordinary skill could combine the teachings of the two references to produce the invention is not the relevant inquiry. The question is whether the references themselves supply some teaching, suggestion or motivation to combine their teachings.

The Applicant submits that there is no suggestion in the Catanzarite or Arsem references that would lead one of ordinary skill in the art to combine their teachings to provide a rechargeable damping arrangement. The Catanzarite Patent discloses the use of an MR damper powered by a battery. There is no discussion of the nature of the battery. In particular, there is no suggestion that the battery is rechargeable or that, as a consequence, the battery is connected to a recharging arrangement. The Arsem patent discloses a particular form of shock absorber that converts reciprocal motion to electricity for charging a vehicle battery. There is no discussion in Arsem of any form of powered damping.

It can be seen that neither reference provides any discussion of a recharging arrangement for a damping system. In the Office Action, the Examiner stated that it would have been obvious “to have constructed the recharging arrangement of Catanzarite to include a piezoelectric generator as taught by Arsem as an alternate equivalent means of recharging the power supply.” Office Action, page 3, third full paragraph. The Applicant counters, however, that the Catanzarite Patent does not disclose the use of a recharging arrangement. Thus, there is no element in the Catanzarite device for the Arsem device to replace as an equivalent. The Examiner concedes this later in the Office Action. (See Office Action, page 7, final full paragraph.) The Examiner suggests, however, that the Catanzarite battery “is certainly capable of being recharged” and that the Arsem device can be used to recharge a rechargeable power supply.

The above discussion shows that the Examiner has identified a problem with the Catanzarite system that is not actually identified or addressed in the Catanzarite Patent. The Examiner then solved this problem using the teachings of the Arsem Patent. This is clearly contrary to the requirement that the suggestion and motivation to combine must be found in the references themselves.

In summary, neither Catanzarite nor Arsem provides any discussion of a recharging arrangement for a damping system. The only motivation to combine the teachings of the two references is that the system of the Catanzarite Patent uses a battery and the system of the Arsem Patent can be used to recharge a battery. In this respect, the Arsem Patent is no different from any reference disclosing the generation of electricity using a piezoelectric generator.

Based on the above, the Applicant submits that the rejection of claims 1 and 29 under 35 U.S.C. 103(a) over the combined teachings of the Catanzarite and Arsem is improper and should be withdrawn.

2. The Catanzarite and Arsem Patents Do Not Disclose the Features of Claims 21 and 29

Even if the teachings of the Catanzarite and Arsem Patents are combined, they do not teach, disclose or suggest the features of claims 21 and 29. With respect to claim 21, for example, the combined teachings of the Catanzarite and Arsem Patents do not teach disclose or suggest an isolation system comprising an MR damper and a damper controller with a rechargeable power supply, all disposed intermediate a base plate and a load plate. With respect to claim 29, the combined teachings of the Catanzarite and Arsem Patents do not teach disclose or suggest a damper controller and a rechargeable power supply that are both disposable intermediate a base wall and a load.

Claims 21 and 29 have been amended to clarify that all of the recited elements of the self-powering damping systems of the invention are co-located in between the load and the base wall. This includes the rechargeable power supply and the recharging arrangement. There is no suggestion in Catanzarite of including a battery inside a damper controller located between the base wall and the load to be isolated. The idea of locating a battery between the base and the load is clearly not contemplated by Arsem, which discusses only the recharging of a vehicle battery.

For at least the above reasons, the Applicant respectfully submits that claims 21 and 29 are patentable over the combined teachings of Catanzarite and Arsem. The Applicant therefore respectfully requests that the rejection of claims 21 and 29 under 35 U.S.C. § 103(a) be withdrawn.

D. Claims 22-24, 30, 34 and 35

Claims 22-24 depend on claim 21 and claims 30, 34, and 35 depend on Claim 29. Because claims 21 and 29 have been shown to be patentable over the Catanzarite and Arsem patents, the Applicant respectfully submits that claims 22-24, 30, 34, and 35 are also patentable over these patents. The Applicant therefore respectfully requests that the rejection of claims 22-24, 30, 34, and 35 under 35 U.S.C. § 103(a) be withdrawn.

II. Paragraph 4 Rejection of Claims 26-28

Claims 26-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Catanzarite in view of Arsem and further in view of Ravizza, U.S. Patent No. 4,080,636 ("Ravizza"). The Applicant respectfully traverses this rejection.

Claims 26-28 depend on claim 21, which has been shown to be patentable over the combined teachings of Catanzarite and Arsem. The Applicant submits that the Ravizza patent does not cure the deficiencies of the Catanzarite and Arsem patents with respect to claim 21. The Ravizza patent was cited for its teachings with respect to a particular form of a piezoelectric generator. It does not discuss the use of such a generator in conjunction with an isolation or damping system.

The Applicant thus submits that claim 21 is patentable over the combined teachings of Catanzarite, Arsem and Ravizza. Because claims 26-28 are dependent on claim 21, claims 26-28 are also patentable over the combined teachings of these references. The Applicant therefore respectfully requests that the rejection of Claims 26-28 under 35 U.S.C. § 103(a) be withdrawn.

III. Paragraph 5 Objection to Claim 25

Claim 25 stands objected to as being dependent upon a rejected base claim. The Applicant appreciates the Examiner's acknowledgement that claim 25 would be allowable

if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Applicant submits, however, that the rejection of claim 21 should be withdrawn, which would remove the basis for the objection to claim 25. The Applicant therefore respectfully requests that the objection to claim 25 be withdrawn.

IV. New Claims

The present Amendment adds new claims 42 and 43. Claim 42 depends on claim 21 and claim 43 depends on claim 29. Both claims recite that the damper controller is attached to one of the set consisting of the base plate and the load plate. The basis for this feature appears in Paragraph 0043 of the original specification.

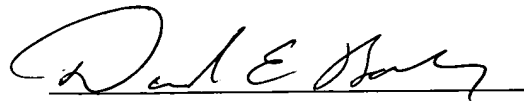
V. Conclusion

For at least the above reasons, the Applicant respectfully submits that claims 21-30, 34, and 35 and new claims 42 and 43 are in condition for allowance. The Applicant therefore requests that the present application be allowed and passed to issue.

Should the Examiner believe anything further is desirable in order to place the Application in even better condition for allowance, the Examiner is invited to contact the Applicant's undersigned representative.

Date: September 7, 2006

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